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The present invention relates to a DNA and RNA polymerases which have increased fidelity (or reduced misincorporation rate). In particular, the invention relates to a method of making such polymerases by modifying or mutating the nucleotide binding domain of the polymerase (e.g., the O-helix). The invention also relates to DNA molecules containing the genes encoding the polymerases of the invention, to host cells containing such DNA molecules and to methods to make the polymerases using the host cells. The polymerases are particularly suited for nucleic acid synthesis, sequencing, amplification and cDNA synthesis.